

### CLAIMS

What is claimed is:

1. A synthesizer, comprising:  
means for receiving an input audio stream representing an audio performance and including a plurality of audio input samples at a first sample rate;  
means for receiving data representing an impulse response that corresponds to an acoustic effect; and  
means for generating an output audio stream based on the input audio stream and the impulse response by convolving the audio input samples with the data representing the impulse response for a portion of the response time and modeling the response during the balance of the response time.
2. The synthesizer of claim 1, further comprising means for receiving from a user an indication of the acoustic effect.
3. The synthesizer of claim 1, wherein the acoustic effect comprises an acoustic modification of the audio performance.
4. The synthesizer of claim 1, wherein the acoustic effect comprises an acoustic modification of the audio performance.
5. The synthesizer of claim 1, wherein the input audio stream comprises a plurality of audio input samples for each of a plurality of input channels.
6. The synthesizer of claim 1, wherein the output audio stream includes a plurality of output channels.

7. The synthesizer of claim 1, wherein the acoustic effect comprises acoustically simulating recording the audio performance using a particular microphone.

8. The synthesizer of claim 1, wherein the acoustic effect comprises acoustically simulating recording the audio performance using a particular microphone placement.

9. The synthesizer of claim 1, wherein the acoustic effect comprises acoustically simulating recording the audio performance in a particular musical context.

10. The synthesizer of claim 1, wherein the acoustic effect comprises acoustically simulating playing at least a portion of the audio performance using a particular instrument body.

11. The synthesizer of claim 1, wherein the acoustic effect comprises acoustically simulating playing at least a portion of the audio performance using a particular instrument placement.

12. The synthesizer of claim 1, wherein the generating means comprises means for recursively extrapolating a tail portion of the output audio stream.

13. The synthesizer of claim 1, wherein the audio performance includes a first number of source channels, and wherein the output audio stream generated by the generating means includes a second number of output channels greater than the first number of source channels.

14. The synthesizer of claim 13, wherein the audio performance includes only a single source channel and wherein the output audio stream comprises a simulated stereo version of the single source channel.